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ABSTRACT

The evolution and administration of testing to measure student progress through a required undergraduate bibliographic instruction course (Library 160) at Iowa State University are described. Bibliographic instruction began at the university in 1890. Through 1958 all colleges within the university received a noncredit required course in library instruction. Some of the colleges enacted a 10-week one-credit course. The basis for the final grade, the format of quizzes and the final examination, and the grading scale are identified. The first uniform course of library instruction was offered in 1971. A 10-week, one-credit course with satisfactory or fail grading was approved by all colleges except engineering, which remained a 5-week course. Four units were covered: card catalog, serials list, indexing and abstracting journals, and reference books. When the university changed from the quarter to the semester system in 1981, the course was redesigned to fit the new system. The role of formative and summative evaluation in measurement of student progress is discussed. (SW)

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Measuring Students' Progress in Bibliographic Instruction, The Iowa State University Experience

Lorna Peterson

ABSTRACT

Describes the evolution and administration of testing to measure student progress through Library 160, a required undergraduate bibliographic instruction course at Iowa State University. A discussion of the role of formative and summative evaluation in measurement of student progress is included. Problems and pitfalls are detailed in the hopes others won't unnecessarily repeat similar errors. Concludes that evaluation of students' progress is essential to, and inevitable in, good teaching.

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Measuring Students' Progress in Bibliographic Instruction, The Iowa State University Experience

Lorna Peterson
Iowa State University
Library Instruction Department

Measurement is an element of evaluation that describes student achievement in quantitative terms. It is typically done by paper and pencil tests and its purpose is to identify student achievement in reaching an instructional goal. This paper describes the development of tests and testing procedures used at Iowa State University to measure and evaluate student progress in Library 160. It is hoped that the description of these local experiences will guide others in avoiding our pitfalls and improving bibliographic instruction evaluation techniques.

The evolution of Library 160 to a required half-credit course is documented in a feature article in the 1981 ALA Yearbook.[1] A description of Library 160 is provided in Adams and Morris, Teaching Library Skills for Academic Credit.[2]

Course Design, Grading, and Testing, 1958-1971

Bibliographic instruction began at Iowa State University in 1890. But previous to 1971, no uniform course of Library Instruction was offered. The 1925-1926 ISU General Catalog first lists the required Library Instruction course.[3] The course varied in length and scope depending upon the college. For the College of Agriculture, the required course was six

weeks, for Engineering and the Physical Sciences College the course was three weeks. It can be stated that through 1958, all colleges received a six, five or three week non-credit required course. In 1959, the College of Agriculture requested a ten week, one credit course. The College of Sciences and Humanities followed that example in 1961, with the exception that only sophomores could register for the course. This was changed to the freshmen level in 1962 at the request of students. Those colleges receiving a five week "R" (Required) course were, the College of Home Economics, College of Engineering, and College of Education. For the one credit sections the final grade was based upon: (a) an average of worksheets = 1/5 (b) an average of quizzes = 1/5 (c) compiling a bibliography = 1/5 and (d) Final examination = 2/5. For the R sections, evaluation was based upon: (a) an average of worksheets = 1/3 (b) an average of quiz and bibliography = 1/3 and (c) Final examination = 1/3. As well as the above, a written and an oral report on a journal relative to the student's major were assigned.

The quizzes under this format were 10 - 12 questions read by the instructor and answered by the student on paper. Quizzes covered material agreed on by the six instructors so that students attending a section other than their own were not penalized.

The final examination was both an objective paper/pencil test and a performance test. Fifty points of the final examination were conducted in the Library Instruction Laboratory where a student was asked to: 1) arrange bibliographic information in the style as illustrated in the Library Instruction Manual

(20 points) 2) Fill out two call slips properly (5 points each) and 3) and 4) Judge from a question given, which library resources would be used to locate answers. Eight library resources were listed and each question was worth ten points. The remaining fifty points were a True/False and multiple choice variety test answered on an IBM answer sheet. Grading for the course was A=100-95, B=94-90, C=89-91, D=80-75, below 75 was failing. For students enrolled in the one credit, ten week section, after worksheets, the bibliography and final examination were averaged, a student may have earned one point for perfect attendance and/or one point for a written and oral report on a journal, completed and turned in on time.[4]

As enrollments swelled in the mid-sixties through the seventies, Library Instruction 160 evolved into a self-paced, self-motivated course. The pressures of grading and record keeping demanded a more efficient teaching process. It was in 1971 that the first uniform course was offered. A ten week, one credit course with Satisfactory or Fail grading was approved and accepted by all colleges except Engineering which remained on a five week course. Within the College of Engineering, the Department of Architecture elected to require the ten week course. The Satisfactory or Fail grading eliminated the need for averaging and ranking students. Although there was less motivation for achievement by the students, precious time was gained for the instructor. Classroom lectures were offered, but students were not required to attend. Students were given instructions and encouraged to use lecture tapes placed on reserve in the Media Department of the ISU Library. Testing remained the primary assessment of measuring

course objectives, but an experimental plan was implemented to analyze a streamlined approach to student evaluation. Increased enrollment diminished the practicality of performance testing and the experimental plan proposed that the laboratory use section of the test be eliminated. Also staff reduction due to budgeting reversion demanded a new method.[5] Twelve sections of 480 students were arbitrarily selected to use a four unit, four test method of evaluation. The four units were 1) Card Catalog 2) Serials List 3) Indexing and Abstracting Journals 4) Reference Bocks. In this pilot project, the student had to successfully pass a test covering each of the four units. Each test ranged in number of items from 30-35, with passing scores ranging from 23-29, depending upon the test. The tests were strictly paper and pencil. Advantages to this method of testing were listed as "a. Permits better use of teaching time. b. Allows for differences in students' library usage backgrounds. c. Offers student his choice of ways of preparing for satisfactory demonstration of library skills. d. Alleviates crowded conditions in Instruction Laboratory."[6] This method of testing was approved for all sections in 1973. The tests were made uniform in terms of the number of items per test (32) and the passing score (26). Fulfilling the course requirement for a Satisfactory grade was thus 1) successfully passing a test over 4 units (4 attempts allowed to receive 26 or better out of 32 possible points) 2) successfully completing an assignment which combined the concepts of the bibliography and journal report, called the "Indexing and Abstracting Journals Assignment."

Testing was reduced to three tests over four units with three chances to pass in 1978. Between 1973 to 1978 staff

was reduced from seven instructors to five and from two graders to zero graders, precipitating the need to reduce the amount of testing. It was also found that the students weren't motivated to finish early, which did not alleviate crowded conditions, the original intent of the plan.[7]

Course Design, Testing and Grading

1981-1986

In 1981, the university changed from the quarter system to the semester system. Gertrude Jacobson and Michael Albright discuss redesigning Library 160 to fit this new system.[8] Planning of the course was concerned with increasing student motivation and course effectiveness. The self-help program failed because of student procrastination and immaturity. For example, eighty-two percent of the students would wait until the last testing period to complete the course. The solution was to make the course a half-credit, half semester course. Students are assigned reading and tasks in the Library Instruction Manual. The worksheets at the end of each chapter are not collected and corrected by the instructor. Students are trusted to complete the work and check their answers provided in the back of the textbook. Testing became a combination of quizzes which do not count in the final grade and a summative objective test given in the fifth week. Course grading remained Satisfactory or Fail, with an "S" being earned by passing the test and turning in a correct "Indexing Services Assignment." The Indexing Services Assignment provides the performance demonstration that the student can identify periodical indexes in his/her subject area, find subjects in an index, select a reference,

and then locate the periodical article given in the reference in the library.

Previous to 1981, 96 test items were on file to cover the four units. The new structure required that one test be given in a fifty minute time period. Therefore, it was necessary to pare the test down. Sixty four was the final number decided upon. Seventeen reference books questions were eliminated; also eliminated were questions which students had the most difficulty answering. Passing was set at 79% or 50 points out of a possible 64 points. Test questions were devised by all instructors with consultation by the department chair. The summative test administered in the fifth week has been used since the Fall of 1981 with some minor changes. In meeting course objectives for the 1980s, the test question distribution covers material from the Library Instruction Manual, and is as follows: six questions from Chapter 1 - "Locations and Services," fourteen questions from Chapter 2 - "Card Catalog," nine questions from Chapter 3 - Locating Publications," seven questions from Chapter 4 - "Reference Materials," fifteen questions from Chapter 5 - "Indexing Services" and thirteen questions from Chapter 6 - "Locating a Periodical." The course objectives for which this test is measuring mastery are: "Locating the various service areas, facilities, and resources available in the ISU Library. Selecting a subject for this literature search and determining the search strategy to use. Obtaining background information from appropriate reference sources. Using the Library of Congress Subject Headings and the Card Catalog to obtain monographic information. Locating and using appropriate indexing services to obtain

references to periodical literature. Determining the physical locations of the periodicals and monographs selected."[9]

Test questions are multiple choice, matching and true/false variety. It is computer scored and analyzed by the ISU Test and Evaluation Service. Instructors receive a printout for each section taught. The printout lists individual scores, the class mean and median, the standard deviation, T score, and an item analysis showing the number of students answering a question correctly. This information is used to help students who failed the first test, attend the review sessions, and take the second test.

TEST CONSTRUCTION

In Library 160's odyssey through student measurement, two kinds of evaluation have been used consistently. These two evaluation types are formative and summative. Formative evaluation is a coaching technique, usually achieved through the administration of quizzes, that provides feedback for the student. It is a monitoring process for improving achievement towards the final goal. Summative evaluation is done at the end of the course and its purpose is generally for the assigning of grades. It is certification that the student has met the course objectives. Summative evaluation provides information for appraising the appropriateness of the course objectives and instructional methods.[10] The final exam and the graded assignment serve as the summative evaluation instruments used in Library 160. The construction of such instruments is no easy task.

Norman Gronlund states that the "main goal in classroom

testing is to obtain valid, reliable, and useful information concerning pupil achievement."[11] To reach that goal it is necessary to define what is to be measured precisely so test items can be written that extract the performance desired. Gronlund suggests that four steps be followed when preparing classroom tests:

1. Determine the purpose of testing: eg., placement, ranking, grading, instructor information needs.
2. Develop the test specifications: eg., level of difficulty, types of learning tasks, unit or course objectives, norm referenced or criterion reference.
3. Select appropriate item types.
4. Prepare relevant test items.[12]

Good test questions are prepared from the course objectives. If your objectives are clear then test construction is made easier. Test questions need to be written clearly, precisely, and with no ambiguity regarding which answer is correct. It is a good idea to have a knowledgeable person take the test to ferret out language problems and vague questions before administering it to students. Have a variety of questions ready so students learn the skill and not the test. Our practice from 1971 through 1985, of standardizing one quiz for multiple class sessions is not recommended.

In 1985 it was recognized that reliance on one quiz for all 3000 students taught in an academic year was ineffective. Students exchanged quizzes or placed them in resident test files, thus nullifying the formative intent to provide feedback. Also students were distracted into learning a quiz item rather than focusing on the skill. To combat this ineffectiveness

and revitalize the feedback purpose, a quiz item bank was built.

Many commercial microcomputer programs exist that include item banking, test generation and other related functions. If this is not feasible, maintaining an item file can be done on a word processor or on index cards. The equipment and staff situation of one's department will dictate which is the best method. The ISU Library Instruction Department easiest access is to a memory typewriter and we have found that it is effective for storing, manipulating and printing items. Gronlund notes that the initial years in building a test file seem like added duties with no or little return.[13] This was true in our case. But as the file grows, so does flexibility and it becomes possible to select items for multiple quizzes without repeating the item too frequently. The added time and effort benefits our students and improves upon instructional goals.

The use of different quizzes in the 54 classes resulted in a more serious attitude displayed by the students and better information for the instructors to use in class lectures. Quizzes closely resembled the final exam and this peaked student interest. The number of items per quiz has increased to 15, versus 10-12 items in previous years. Formative evaluation was restored to the process where both student and teacher gained feedback regarding learning successes and failures.

THE FUTURE

Library 160's future is uncertain. The Dean of Library Services proposed that Library 160 be eliminated as a cost

saving measure. Also, it was mandated in 1986 by the University President that all remedial courses be abolished. He is particularly interested in the dissolution of Library Instruction 160. Although some faculty do not view bibliographic instruction as remedial, the argument has fallen on deaf ears. Increased budgetary limitations have forced the Dean of Library Services to reduce personnel and services and the Library Instruction Department has been hit hard during fiscal years 1986 and 1987. Since 1985 the Department has lost a full time head and a full time instructor. These vacancies have been eliminated from the budget.

As in the past, staff reduction precipitated the need for even more streamlined procedures. Although the measures of student progress remain the same, the sequence in administration has changed. The course remains five weeks long with two quizzes and a final exam. The graded Indexing Services Assignment, once due Week Five is now due Week Three. This shifts course emphasis to using periodical indexes and finding periodical articles in the Library. The emphasis shift reflects itself on test construction and although the future of the course remains uncertain, new quizzes and tests are being devised to reflect the new course objectives during our interim period.

CONCLUSIONS

Evaluation and measurement is as essential as it is inevitable in teaching. It is a process that aids teachers in diagnosing student problems, course design flaws, and instructional methods. And it is a process profoundly affected by enrollment, budget, and time.

Fortunately abundant resources are available to aid the library instructor in developing good evaluation measures. Use the university testing service, seek the advice of the university instructional design personnel, solicit the expertise of faculty members in education, psychology, and statistics. And don't spin your wheels. In an effort to be accommodating to students we placed too much work on ourselves. Multiple chances to test produced voluminous recordkeeping. The responsibility to learn the material quickly and thoroughly was taken off the student and the staff paid for this kindness in paperwork. Identify and eliminate the time wasting procedures, especially if it is a procedure that pampers the student. Under the newest, most rigid system, 90% of our students pass the first test. This compares to 85% for 1981-1986, which was a great improvement over the trickling effect experienced in 1978-1981. Good evaluation techniques result in good information to use in course improvement, course description, and course documentation. They are worth the time and effort to develop. And good evaluation techniques are the hallmarks of good teaching.

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